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Stanton County Test Hole Logs

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STANTON COUNTY Test-Hole Logs

Sue Olafsen Lackey, Frank A. Smith and Raymond R. Burchett

**Nebraska Water Survey
Test-Hole Report No. 84**

**Conservation and Survey Division
Institute of Agriculture and Natural Resources
University of Nebraska-Lincoln**



March 1999



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The Conservation and Survey Division of the University of Nebraska is the agency designated by statute to investigate and interpret the geologically related natural resources of the state, to make available to the public the results of these investigations, and to assist in the development and conservation of these resources.

The division is authorized to enter into agreements with federal agencies to engage in cooperative surveys and investigations in the state. Publications of the division and the cooperating agencies are available from the Conservation and Survey Division, University of Nebraska, Lincoln, Nebraska 68588-0517.

The Conservation and Survey Division provides information and educational programs to all people without regard to race, color, national origin, sex or handicap.

Publication and price lists are furnished upon request.

March 1999

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INTRODUCTION

In 1930, the Conservation and Survey Division of the University of Nebraska and the U.S. Geological Survey began a program of cooperative groundwater studies in Nebraska. Since then test drilling by use of rotary drilling equipment has been an integral part of that program. This report contains logs of all the test holes drilled in the county under the program as well as those drilled by the Conservation and Survey Division with financial assistance from other government agencies.

The map in this report shows the location of all test holes drilled in the county since 1930.

Present techniques of test-hole logging and sampling include use of drilling mud suitable to drilling conditions, timing by stopwatch of the drilling of each 5-foot increment of depth, and removal of all cuttings from the test hole at intervals of 5 feet or less. During the drilling of the hole, cuttings from each interval are examined immediately; samples representing each 5-foot interval and each recognizable change in material are retained. After samples are washed, they are described lithologically and the color is evaluated by comparison with standard color charts. The samples then are dried, stored, and cataloged. Beginning in September 1951, the test holes have been logged electrically. All samples are processed and kept on open file in the offices of Conservation and Survey Division, 113 Nebraska Hall, University of Nebraska-Lincoln, 68588.

This publication is one of a series being issued to make more readily available the record of test holes drilled since 1930. The series of publications is made on a county basis and includes, with some exceptions, logs of all test holes drilled in each of the counties. The logs have not been reviewed for conformance with editorial standards and nomenclature.

The method whereby the altitude of the land surface at testhole sites was determined is indicated in the heading of each log, as follows: a = altimeter, h = hand leveling, i = instrument leveling, t = estimated from topographic map.

The test-hole records accurately reflect subsurface conditions only at the locations where the test holes were drilled. Interpretive data reflecting probable subsurface conditions between test-holes are being compiled for publication in county reports and are available for inspection in the office of the Conservation and Survey Division.

Each test hole is identified by a number assigned in the field (for example #3-B-67, #41-79), and most are also identified by a number indicating its location within the land divisions of the U.S. Bureau of Land Management's survey of Nebraska. Location numbers of test holes east of the 6th principal meridian, which passes through Columbus in a north-south direction, are preceded by the capital letter A; those west of the principal meridian have no preceding letter. The first numeral indicates the township, the second the range, and the third the section. As shown in figure 1, the letters that follow the section number indicate the location of the test hole within the section, the first letter indicating the quarter section and the second letter indicating the quarter-quarter section. The letters A, B, C, and D are applied in counterclockwise direction beginning with A in the northeast quadrant. The last numeral is the serial number of the test hole within the quarter-quarter section. No number is shown unless more than one test hole is within the given quarter-quarter section.

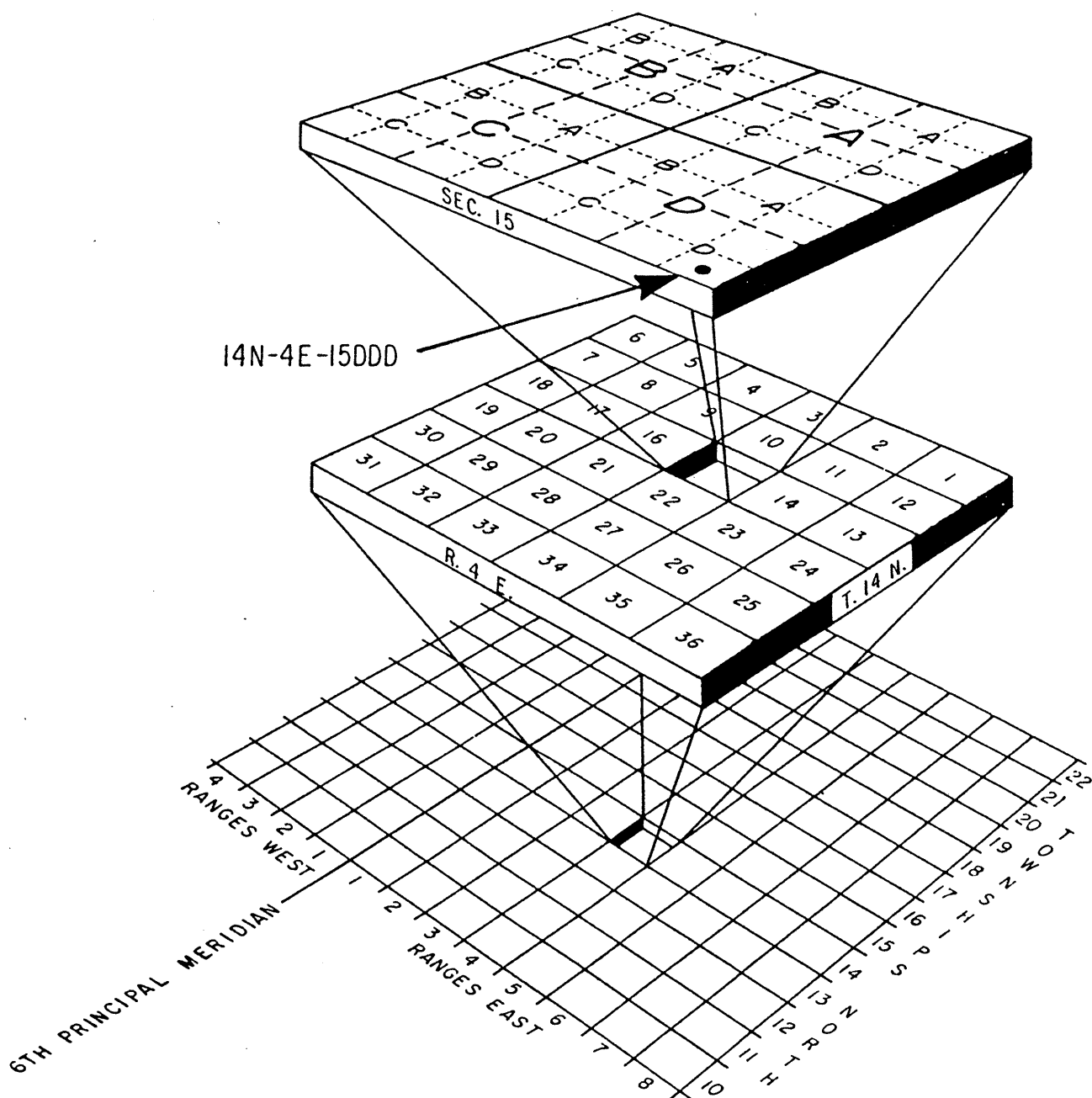


Fig. 1. System for identifying test-holes according to their location.

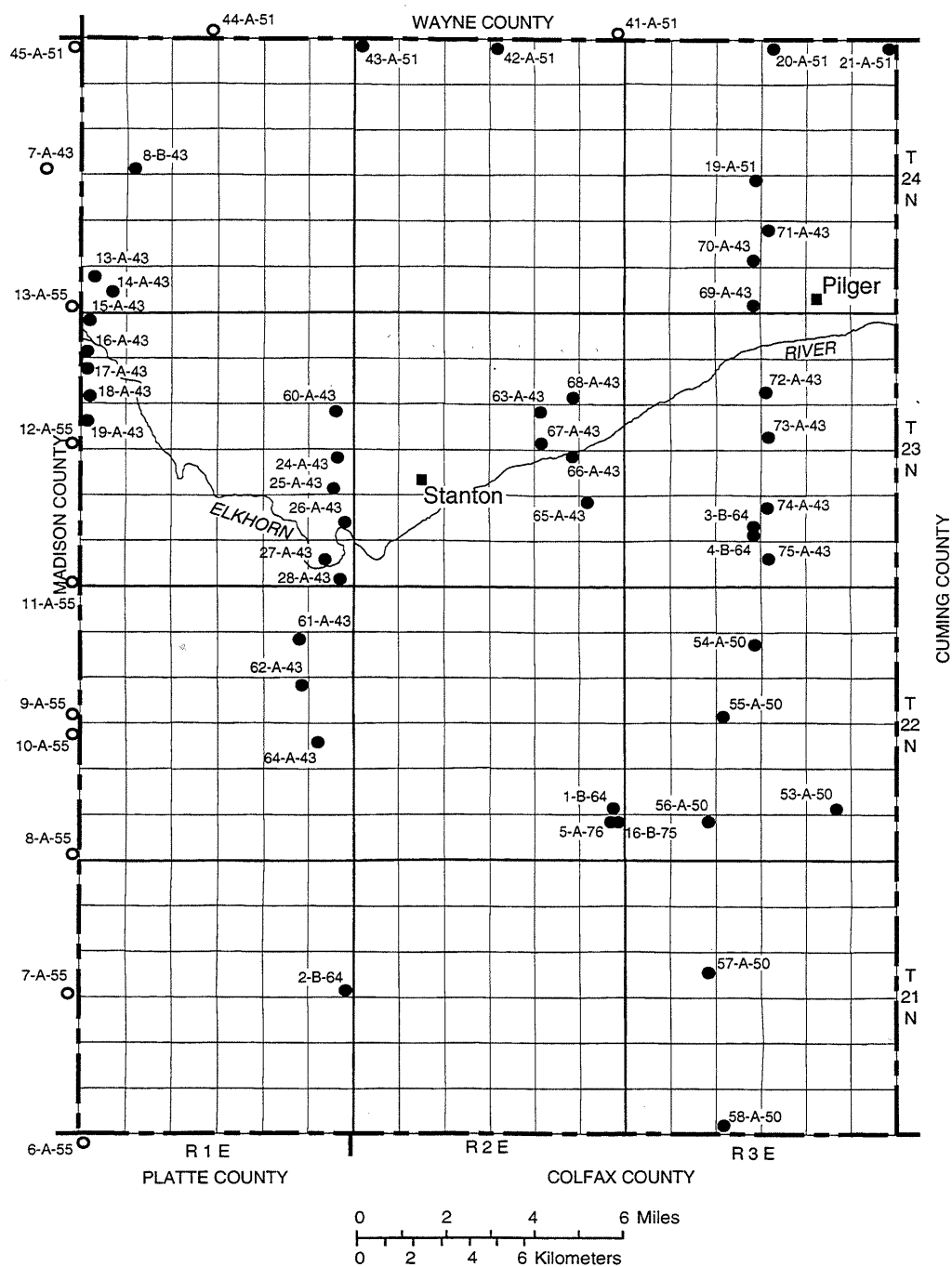
Stanton County

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Test-hole logs are arranged in this publication by township, range and section.



- Test hole description published in this report
- Test hole description published in other report

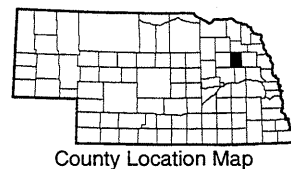


Fig. 2. Test-hole location map of Stanton County.

Test Hole #2-B-64
(21N-1E-13ddda)
Stanton County

Location: NE SE SE SE Sec. 13, T. 21 N., R. 1 E., approximately 5 feet west and 481 feet north of the southeast corner.
 Ground elevation: 1,773 ft. (t). (Madison SE, 7.5 min. quadrangle)
 Depth to water: 34.13 ft. perched (7-2-64)

Depth, in feet
 From To

Quaternary System, undifferentiated:

Road fill; no sample.....	0.0	0.5
Silt, slightly clayey, light yellow brown; below 8 ft, iron stained; below 9 ft, slightly calcareous, some limy nodules.....	0.5	13.0
Silt, slightly clayey, moderately calcareous, light yellow brown; below 15 ft, light olive brown to grayish brown; below 25 ft, limy nodules.....	13.0	30.0
Silt, slightly clayey, slightly calcareous, light olive brown; below 42 ft, some snail shells.....	30.0	48.0
Silt, slightly clayey, gray.....	48.0	51.0
Silt, slightly clayey, dark bluish gray.....	51.0	53.0
Silt, very clayey, slightly sandy, dark brownish gray; sand is very fine; some yellow stain from 56 to 59 ft; brownish gray below 59 ft.....	53.0	60.0
Silt, very clayey, gray; contains rare sand grains; below 65 ft, sandy, sand is very fine.....	60.0	69.0
Silt, clayey, in part calcareous, blueish gray; below 70 ft, few very fine sand grains.....	69.0	73.0
Silt, clayey, light gray, moderately to very calcareous; below 74 ft, mottled grayish brown, many limy nodes.....	73.0	74.0
Silt, moderately clayey, olive.....	74.0	75.0
Silt, very clayey, moderately calcareous, brown; contains few fine sand grains.....	75.0	77.0
Clay, silty, moderately calcareous, yellowish brown; contains few limy grains and very fine sand grains; below 80 ft, very calcareous.....	77.0	81.0
Clay, silty, sandy, light brownish gray; sand is very fine; contains limy nodes.....	81.0	82.0
Silt, clayey, mottled brown and gray; contains limy nodes; below 85 ft, black stain, few very fine sand grains.....	82.0	88.0
Silt, moderately clayey, moderately calcareous; some very fine sand grains; some limy grains, some		

limonitic stain.....	88.0	90.0
Clay, silty; moderately calcareous to 92 ft; gray to brownish gray; some very fine sand, some manganese grains, some limonitic stain.....	90.0	96.0
Till; silt, clayey, moderately calcareous, brownish gray.....	96.0	98.0
Till; silt, clayey, sandy, gravelly to pebbly, very calcareous, grayish brown; below 100 ft, mottled yellow brown, some pale olive; below 102 ft, boulder fragments.....	98.0	103.0
Till; silt, clayey, sandy, gravelly, very calcareous, yellow brown, some gray and olive, some iron and manganese stain.....	103.0	152.0
Till; silt, clayey, sandy, gravelly, very calcareous, dark grayish brown with black, some iron stain.....	152.0	177.0
Till; silt, clayey, sandy, gravelly, very calcareous, gray and greenish yellow, mostly olive; below 186 ft, principally medium gray; below 210 ft, slightly more sand.....	177.0	238.5
Sand and gravel, medium sand to coarse gravel, few pebbles.....	238.5	239.5
Till; silt, clayey, sandy, gravelly, very calcareous, medium gray.....	239.5	331.0
Sand, very fine to coarse; much quartz with dark and green silicates.....	331.0	340.0
Cretaceous System -Upper Cretaceous Series - Colorado Group:		
Niobrara Formation:		
Shale, clayey, very calcareous, pale yellow; below 345.4 ft, brown.....	340.0	348.0
Cretaceous System - Upper Cretaceous Series - Colorado Group:		
Carlile Formation:		
Shale, clayey, sandy, very calcareous, light medium gray; sand is very fine; below 362 ft, darker gray; below 373 ft, olive tint.....	348.0	380.0

Test Hole #57-A-50
(21N-3E-17add)
Stanton County

Location: SE SE SE NE Sec. 17, T. 21 N., R. 3 E., approximately 2,640 feet south and 10 feet west of northeast corner.
 Ground elevation: 1,735 ft. (t). (Stanton SE, 7.5 min. quadrangle)
 Depth to water: 32.4 ft. (11-8-50)

Depth, in feet
 From To

Quaternary System, undifferentiated:

Road fill and soil; silt, dark gray.....	0.0	1.0
Soil; silt, slightly clayey, dark grayish brown.....	1.0	3.0
Silt, moderately clayey, light gray.....	3.0	4.5
Silt, slightly clayey, light yellowish gray; slightly calcareous below 10 ft; moderately calcareous below 18 ft; contains a few gastropod shells below 35 ft; light bluish gray below 40 ft.....	4.5	45.5
Silt, light bluish gray.....	45.5	52.5
Clay, silty, medium brown; contains some gastropod shells; light grayish brown below 55.0 ft.....	52.5	57.0
Clay, silty, light gray with limonite stain.....	57.0	57.5
Till; clay, silty to slightly sandy, very calcareous, light gray; contains many limy and limonitic fragments.....	57.5	60.0
Till; clay, silty to sandy and gravelly, very calcareous, light yellowish gray with iron stain; contains many limy fragments; very gravelly below 65.5 ft.....	60.0	67.5
Till; clay, silty to sandy and gravelly, very calcareous, medium gray; iron stained from 70 to 75 ft, 82.5 to 85 ft, and 103 to 104 ft.....	67.5	122.0
Clay, silty to slightly sandy, medium gray to dark gray; contains very fine to fine sand.....	122.0	124.0
Till; clay, silty to sandy and gravelly, moderately calcareous, medium gray with some iron stain; contains some limy fragments; light yellowish gray from 130 to 145 ft; very calcareous below 135 ft; brownish gray from 145 to 147 ft and from 155 to 160 ft.....	124.0	160.0
Till; clay, silty, slightly to moderately sandy to gravelly, very calcareous, light yellowish gray to light brownish gray; in part iron stained.....	160.0	184.8
Till; clay, silty, moderately sandy to gravelly, very calcareous, dark yellowish brown.....	184.8	192.0

Till; silt, clayey, moderately sandy to gravelly, very calcareous, light gray to light yellowish gray; medium gray below 202.5 ft.....	192.0	244.8
Till; silt, slightly clayey to very sandy, very calcareous, medium gray; contains very fine to fine with some medium sand.....	244.8	246.0
Till; clay, silty, moderately sandy to gravelly, very calcareous, medium gray.....	246.0	344.0
Sand, quartz and a few light green silicates; texture grades from very fine to coarse; contains a trace of interbedded light gray silt.....	344.0	357.5
Silt, very sandy, slightly calcareous, light gray; contains very fine to fine with some medium sand..	357.5	359.0
Sand interbedded with silt, very sandy, light gray; texture of sand grades from very fine to very coarse.....	359.0	365.0
Sand, very fine to very coarse; contains a trace of fine gravel below 380 ft.....	365.0	400.5
Silt, clayey, to siltstone; moderately calcareous, light gray.....	400.5	407.5
Sand, very fine to coarse; cemented from 409 to 411 ft and 419 to 420 ft; contains a trace of very coarse sand below 420 ft.....	407.5	429.0
Cretaceous System - Upper Cretaceous Series - Colorado Group:		
Carlile Formation:		
Shale, clayey, moderately calcareous, dark gray.....	429.0	440.0

Test Hole #58-A-50
(21N-3E-33cccc)
Stanton County

Location: SW SW SW SW Sec. 33, T. 21 N., R. 3 E., approximately 25 feet north and 50 feet east of southwest corner.
 Ground elevation: 1,603 ft. (t). (Clarkson, 7.5 min. quadrangle)
 Depth to water: 31.6 ft. (11-8-50)

Depth, in feet
 From To

Quaternary System, undifferentiated:

Soil; silt, slightly to moderately clayey, dark grayish brown.....	0.0	1.2
Silt, moderately clayey, dark yellowish brown; medium yellowish brown below 2 ft.....	1.2	2.5
Silt, very clayey, medium yellowish brown; light gray below 3.5 ft.....	2.5	4.0
Silt, moderately clayey, light gray; contains a few limonitic flecks below 5.5 ft.....	4.0	8.0
Silt, slightly clayey, light yellowish gray; contains some limonitic flecks.....	8.0	10.0
Silt, medium brownish yellow; slightly calcareous and light gray below 13.5 ft.....	10.0	15.0
Silt, slightly clayey, slightly calcareous, light yellowish gray; moderately calcareous and light yellowish brown below 20 ft; contains a few snail shells below 25 ft.....	15.0	38.0
Silt, light gray with blue tint; in part brown below 40 ft.....	38.0	44.0
Silt, dark gray to black, carbonaceous.....	44.0	46.5
Silt, slightly clayey, dark gray and dark brown.....	46.5	48.0
Silt, moderately clayey, light bluish gray.....	48.0	50.0
Silt, moderately clayey to slightly sandy, slightly calcareous, light bluish gray; contains fine to coarse sand.....	50.0	52.0
Silt, clayey, slightly sandy to gravelly, moderately calcareous, light yellowish brown.....	52.0	60.0
Till; silt, clayey, slightly sandy to gravelly, moderately calcareous, medium yellowish brown; light brownish yellow below 63 ft.....	60.0	65.0
Till; silt, clayey, slightly sandy to gravelly, very calcareous, light yellowish gray; light gray below 66.5 ft; iron stained below 70 ft.....	65.0	84.2
Silt, clayey, medium brownish gray.....	84.2	84.6
Till; silt, clayey to slightly sandy, moderately		

calcareous, yellowish brown.....	84.6	85.0
Till; clay, silty, slightly to moderately sandy and gravelly, very calcareous, light gray to light yellowish gray; light yellowish brown below 90 ft.	85.0	96.0
Till; silt, sandy, very calcareous, medium yellow- ish brown; contains very fine to fine sand.....	96.0	98.0
Till; silt, moderately clayey to slightly sandy, very calcareous, medium yellowish brown.....	98.0	100.0
Till; silt, clayey, slightly sandy to gravelly, very calcareous, light yellowish brown; dark gray below 105 ft.....	100.0	106.5
Till; clay, silty, slightly sandy to gravelly, moderately calcareous, light yellowish brown.....	106.5	110.0
Till; silt, clayey to slightly sandy, moderately calcareous, medium yellowish brown.....	110.0	113.0
Till; clay, silty, slightly sandy to gravelly, very calcareous, light yellowish brown with some dark gray layers; dark gray below 118 ft.....	113.0	120.0
Till; clay, silty, slightly to moderately sandy and gravelly, very calcareous, medium gray to dark gray.....	120.0	166.5
Sand and gravel interbedded with till; very calcareous.....	166.5	169.5
Till; clay, silty, moderately sandy to gravelly, very calcareous, medium gray to dark gray.....	169.5	200.5
Sand and gravel, quartz and many light green sili- cates; texture grades from sand to fine gravel with some medium gravel; contains a trace of coarse gravel from 205 to 210 ft.....	200.5	235.0
Sand and gravel, quartz and many light green sili- cates; texture grades from sand to medium gravel..	235.0	262.7
Cretaceous System - Upper Cretaceous Series - Colorado Group:		
Carlile Formation:		
Shale, clayey, dark gray.....	262.7	280.0

Test Hole #61-A-43
(22N-1E-11aaaa)
Stanton County

Location: NE NE NE NE Sec. 11, T. 21 N., R. 1 E., approximately 45 feet south west of northeast corner.

Ground elevation: 1,480 ft. (t). (Madison NE, 7.5 min. quadrangle)

Depth to water: 7.9 ft. (9-30-43)

Depth, in feet

From To

Quaternary System, undifferentiated:

Clay, silty, to silt, clayey, medium gray; contains limy concretions.....	0.0	22.0
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Sand, gray; texture grades from fine to coarse; contains some fine to medium gravel.....	22.0	52.0
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Gravel, pink and dark gray; texture grades from fine to medium; contains some coarse sand.....	52.0	87.0
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Tertiary System - Miocene Series - Ogallala Group:

Siltstone, sandy, light gray.....	87.0	99.0
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Test Hole #62-A-43
(22N-1E-14aaaa)
Stanton County

Location: NE NE NE NE Sec. 14, T. 22 N., R. 1 E., approximately 54 feet southwest of northeast corner.

Ground elevation: 1,500.0 ft. (i). (Madison NE, 7.5 min. quadrangle)

Depth to water: 28.7 ft. (9-30-43)

	<u>Depth, in feet</u>	
	From	To
Quaternary System, undifferentiated:		
Clay, silty to sandy, dark brownish gray.....	0.0	7.0
Sand, gray; texture grades from medium to coarse; contains some silty clay.....	7.0	29.0
Silt, clayey, medium brownish gray.....	29.0	34.0
Sand, gray; texture grades from medium to coarse; contains a trace of fine gravel below 44.0 ft.....	34.0	64.0
Gravel, pink and dark gray; texture grades from fine to medium; contains some coarse sand.....	64.0	99.0

**Test Hole #64-A-43
(22N-1E-24bccb)
Stanton County**

Location: NW SW SW NW Sec. 24, T. 22 N., R. 1 E., approximately
2,100 feet south and 90 feet east of the northwest corner.

Ground elevation: 1,566.0 ft. (i). (Madison SE, 7.5 min. quadrangle)

Depth to water: Unknown; test hole caved at 11.0 ft. (9-30-43).

Depth, in feet

From To

Quaternary System, undifferentiated:

Clay, silty, dark brownish gray.....	0.0	3.0
Sand, brownish gray; texture grades from fine to coarse, contains a trace of fine gravel.....	3.0	13.0
Clay, silty, to silt, clayey; medium gray, in part pinkish tan; darker below 54 ft.....	13.0	64.0
Till; clay, silty to pebbly, medium gray to dark gray.....	64.0	69.0

Test Hole #1-B-64
(22N-2E-25dccc)
Stanton County

Location: SW SW SW SE Sec. 25, T. 22 N., R. 2 E., approximately
 2,596 feet west and 5 feet north of the southeast corner.
 Ground elevation: 1,763 ft. (t). (Stanton SW, 7.5 min. quadrangle)
 Depth to water: 47.36 ft, perched (7-2-64)

	<u>Depth, in feet</u>	
	From	To
Quaternary System, undifferentiated:		
Road fill; no sample.....	0.0	4.0
Silt, slightly sandy, pale brown to light yellowish brown; sand is very fine; below 5 ft, light yellowish brown with some light brownish gray.....	4.0	15.0
Silt, slightly sandy, slightly to in places moder- ately calcareous, light brownish gray; sand is very fine, some limy nodules; from 15 to 16 ft, grayish brown; below 17 ft, some limonitic staining.....	15.0	20.0
Silt, slightly clayey, slightly sandy, slightly to in places moderately calcareous, light olive brown, some limonitic staining; sand is very fine; below 29 ft, some limy nodules; below 35 ft, mottled light brownish gray to light olive gray...	20.0	38.0
Silt, slightly clayey, moderately calcareous, light olive brown, some limonitic and manganese staining; from 45 to 47 ft, trace of limy nodules; from 54 to 55 ft, light brownish gray.....	38.0	59.0
Silt, slightly clayey, dark greenish gray; below 60 ft, dark blueish gray, contains snail shells.....	59.0	66.0
Silt, clayey, dark olive gray; contains carbonaceous material; below 68 ft, very dark brownish gray....	66.0	70.0
Silt, slightly clayey, blueish gray to olive gray; some carbonaceous material and volcanic ash.....	70.0	72.0
Silt, very clayey, very dark gray; from 74 to 75 ft, medium gray; below 75 ft, dark gray.....	72.0	76.0
Silt, very clayey, slightly sandy, blueish gray; sand is very fine to fine.....	76.0	77.0
Till; clay, silty, sandy, blueish gray; sand is coarse to very coarse; contains limy concretions..	77.0	80.0
Till; clay, silty, sandy, gravelly, some pebbles, slightly to moderately calcareous, blueish gray;		

from 81 to 85 ft, mottled gray to olive and olive gray; below 85 ft, brownish gray and olive brown, some yellowish brown.....	80.0	96.0
Boulder, weathered, very calcareous, yellowish brown.....	96.0	96.5
Silt, sandy, clayey, slightly to moderately calcareous, pale brown; contains trace of pebbles.	96.5	99.0
Silt, sandy, clayey, mottled light gray and light olive brown, some manganese stain; below 100 ft, some gravel and pebbles; below 103 ft, light brownish gray, some olive yellow.....	99.0	109.0
Pebble zone, sandy, clayey, grayish brown and olive brown, with limonitic and manganese stain.....	109.0	110.0
Silt, clayey, slightly sandy, gravelly and pebbly, slightly calcareous, grayish brown.....	110.0	115.0
Silt, clayey, sandy, gravelly, slightly to moderately calcareous, light brownish gray, some grayish brown; below 123 ft, slightly calcareous..	115.0	126.0
Till; silt, clayey, sandy, gravelly, some pebbles; slightly to moderately calcareous, grayish brown; below 200 ft, very dark brown.....	126.0	250.0
Till; silt, clayey, sandy, gravelly, slightly to moderately calcareous, dark gray; possible boulders from 260 to 270 ft; from 270 to 275 ft, pebbly; below 275 ft, limy grains.....	250.0	280.0
Till; silt, clayey, sandy, gravelly, slightly to moderately calcareous, medium dark gray; from 283.5 to 283.8 ft, quartzite, below 295 ft, medium gray to gray; below 320 ft, slightly calcareous...	280.0	370.0
Till; silt, clayey, sandy, gravelly, slightly calcareous, medium to light gray.....	370.0	378.0
Sand, very fine to medium, some coarse; thick mud, sample not representative.....	378.0	379.0
Till; silt, clayey, sandy, probably gravelly, slightly calcareous; below 380 ft, rare shell fragments.....	379.0	387.0
Sand, very fine to medium, some coarse, probably not representative sample.....	387.0	397.0
Till; silt, clayey, sandy, sandy, gravelly, slightly calcareous, medium gray.....	397.0	408.0
Cretaceous System - Upper Cretaceous Series - Colorado Group:		
Carlile Formation:		
Shale, clayey, waxy dark gray; below 420 ft, olive gray; from 427.9 to 428.1 ft and from 428.7 to 428 ft, indurated zones.....	408.0	430.0

Test Hole #16-B-75
(22N-2E-36abbb)
Stanton County

Location: NW NW NW NE Sec. 36, T. 22 N., R. 2 E., approximately
 2,589 feet west and 8.7 feet south of the northeast corner.
 Ground elevation: 1,765 ft. (t). (Stanton SW, 7.5 min quadrangle)
 Depth to water: 48.0 ft. (8-1-75)

	<u>Depth, in feet</u>	
	From	To
Quaternary System, undifferentiated:		
Road fill; silty clay, dark brown.....	0.0	2.5
Silt, clayey, moderately sandy, light yellow brown; sand is very fine; below 7.7 ft, moderately calcareous, some limy nodules.....	2.5	10.0
Silt, clayey, slightly calcareous, light yellowish brown; some nodules and iron stain; below 15 ft, some gray.....	10.0	40.0
Silt, moderately clayey, moderately sandy, moderately calcareous, mottled grayish brown and olive brown; sand is very fine.....	40.0	45.0
Silt, moderately clayey, moderately calcareous, grayish brown; below 45.3 ft, light olive brown; from 52.2 to 53.7 ft, some carbonaceous material..	45.0	56.6
Silt, moderately clayey, moderately calcareous, light gray with brown mottling.....	56.6	58.9
Silt, moderately clayey, slightly sandy, greenish gray; sand is very fine; slightly calcareous from 58.9 to 60 ft; below 66.8 ft, some black mottling.	58.9	67.7
Silt, moderately clayey, very dark gray to black; contains peat fragments.....	67.7	69.7
Silt, moderately clayey, dark greenish gray; below 71.5 ft, some dark gray clay.....	69.7	71.8
Silt, very clayey, gray.....	71.8	73.2
Clay, silty, gray.....	73.2	76.8
Clay, silty, sandy, greenish gray; sand is very fine to coarse, trace pebbles; some limy nodules from 76.8 to 78.3 ft; below 78.3 ft, slightly calcareous.....	76.8	80.0
Till; clay, silty, sandy, moderately calcareous, greenish gray; contains iron stain and limy nodules; below 83 ft, very calcareous; from 83 to 85 ft, light yellowish brown; below 85 ft, light brownish gray.....	80.0	98.3
Silt, moderately clayey, sandy, very calcareous,		

mottled yellow brown and light gray.....	98.3	98.9
Till; clay, silty, sandy, trace gravel, very calcareous, mottled yellow brown and gray; below 119.3 ft, some pebbles.....	98.9	120.0
Till; clay, silty, sandy, trace gravel, some pebbles, very calcareous, grayish brown and light brownish gray.....	120.0	134.0
Clay, moderately silty, dark brownish gray.....	134.0	135.0
Silt, very clayey, grayish brown; limy specks.....	135.0	135.5
Clay, silty, moderately calcareous, dark grayish brown.....	135.5	141.3
Till; silt, clayey, sandy, trace gravel, very calcareous, pale olive; below 145 ft, moderately calcareous, some lime nodules.....	141.3	155.0
Till; silt, clayey, sandy, much shale fragments and pebbles, brownish gray.....	155.0	161.5
Till; clay, silty, sandy, gravelly, very calcareous, pale brown, some gray and olive gray.....	161.5	180.0
Till; silt, clayey, sandy, trace of gravel, very calcareous, olive; below 180.5 ft, dark gray.....	180.0	220.0
Till; silt, clayey, sandy, trace gravel, moderately calcareous, dark greenish gray; below 225 ft, very calcareous; below 270 ft, much gravel.....	220.0	275.0
Till; silt, clayey, sandy, gravelly, very calcareous, dark gray, below 290 ft, some pebbles.	275.0	404.5
Cretaceous System - Upper Cretaceous Series - Colorado Group:		
Carlile Formation:		
Shale, black.....	404.5	405.0

Test Hole #5-A-76
(22N-2E-36abbb)
Stanton County

Location: NW NW NW NE Sec. 36, T. 22 N., R. 2 E., approximately
 2,604 feet west and 8.7 feet south of the northeast corner.
 Ground elevation: 1,765 ft. (t). (Stanton SW, 7.5 min. quadrangle)
 Depth to water: Unknown. (5-3-76)

	<u>Depth, in feet</u>	
	From	To
Quaternary System, undifferentiated:		
Road fill; no sample.....	0.0	2.0
Topsoil; no sample.....	2.0	2.3
Silt, moderately clayey, slightly sandy, yellow brown; sand is very fine to fine.....	2.3	3.5
Silt, slightly clayey, slightly sandy, light olive brown; sand is very fine.....	3.5	5.0
Silt, slightly clayey, moderately calcareous, dark brown; below 10.5 ft, some light gray.....	5.0	11.4
Silt, slightly clayey, moderately calcareous, yellow brown and light gray, some staining from 30 to 40 ft, slightly darker; below 40 ft, more clay.	11.4	45.8
Silt, slightly clayey, slightly calcareous, light olive brown; contains snail shells and limy zones.....	45.8	58.0
Silt, slightly clayey, slightly sandy, slightly calcareous, greenish gray; sand is fine; contains some snails below 60 ft.....	58.0	68.0
Silt, moderately clayey, dark gray; contains organic material.....	68.0	70.0
Silt, moderately clayey, slightly sandy, dark gray; sand is very fine.....	70.0	71.3
Silt, moderately clayey, gray; below 72 ft, very dark gray.....	71.3	77.8
Silt, moderately clayey, slightly sandy, greenish gray; sand is very fine to medium; below 79.2 ft, less clayey, more sandy, some limy nodes.....	77.8	82.3
Till; silt, clayey, some pebbles, moderately calcareous, greenish gray; below 83.6 ft, some gray mottling; below 90 ft, very calcareous, grayish brown some iron stain; below 100.5 ft, some gray.....	82.3	130.0
Till; silt, clayey, sandy, moderately calcareous, grayish brown.....	130.0	134.0
Silt, clayey, slightly sandy, very dark grayish		

brown; sand is fine to medium; from 134.5 to 134.6 ft, moderately calcareous, grayish brown; below 134.6 ft, slightly calcareous.....	134.0	136.0
Silt, very clayey, very calcareous, dark brown.....	136.0	141.7
Silt, clayey, moderately calcareous, grayish brown..	141.7	141.9
Silt, moderately clayey, moderately sandy, very calcareous, light yellowish brown; sand is coarse to very coarse, trace of fine gravel; below 150 ft, much iron and manganese stain.....	141.9	160.0

Test Hole #54-A-50
(22N-3E-9aadd)
Stanton County

Location: SE SE NE NE Sec. 9, T. 22 N., R. 3 E., approximately 1,264 feet south and 21 feet west of northeast corner.

Ground elevation: 1,673 ft. (a). (Stanton NE, 7.5 min. quadrangle)

Depth to water: 44.6 ft. (10-6-50).

	<u>Depth, in feet</u>	
	From	To
Quaternary System, undifferentiated:		
Soil; silt, moderately clayey, dark brownish gray; dark yellowish brown below 1 ft.....	0.0	1.5
Silt, moderately clayey, medium yellowish brown; slightly clayey below 5 ft.....	1.5	8.5
Silt, slightly clayey, moderately calcareous, light yellowish brown with iron staining.....	8.5	32.5
Silt, slightly to moderately calcareous, light yellowish gray and dark brownish yellow; contains a few gastropod shell fragments below 40 ft; light grayish brown below 45.5 ft.....	32.5	47.5
Silt, slightly clayey, light bluish gray; contains a few gastropod shells.....	47.5	49.5
Silt, slightly to moderately clayey, medium gray; contains a few gastropod shells.....	49.5	53.5
Silt, moderately clayey, light yellowish gray.....	53.5	55.0
Silt, very clayey, light brown; contains a trace of fine to coarse sand.....	55.0	56.0
Till; silt, moderately clayey to slightly sandy, in part slightly calcareous, light yellowish gray....	56.0	58.0
Till; silt, moderately clayey to slightly sandy, moderately calcareous, light brownish yellow; contains many limy nodules; very calcareous below 60 ft; light olive gray below 61.5 ft; light bluish gray below 63 ft; light yellowish brown to grayish brown below 64.5 ft.....	58.0	66.0
Till; clay, silty to slightly sandy and gravelly, very calcareous, light gray, mottled brown.....	66.0	99.5
Sand and gravel, moderately calcareous; texture grades from medium sand to medium gravel.....	99.5	103.5
Till; clay, silty, slightly to moderately sandy and gravelly, moderately calcareous, light gray with green tint; yellowish brown below 104.5 ft; light brownish gray below 125 ft; medium gray below 135 ft.....	103.5	139.0

Sand and gravel, contains many black grains and a few chalk fragments.....	139.0	146.5
Till; clay, slightly to moderately silty to sandy and gravelly, moderately calcareous, yellowish brown; light gray below 151 ft.....	146.5	158.5
Silt, sandy, moderately calcareous, medium brownish yellow; contains very fine to fine sand.....	158.5	162.0
Till; silt, clayey to slightly sandy, moderately calcareous, medium yellowish brown.....	162.0	163.0
Till; clay, silty to slightly sandy and gravelly, moderately calcareous, medium gray to dark gray...	163.0	216.0
Clay, silty, light gray.....	216.0	217.0
Clay, silty, moderately calcareous, light brown; slightly calcareous and contains some very fine to fine sand below 223.5 ft.....	217.0	225.0
Clay, silty to sandy; contains very fine to medium sand with some coarse sand.....	225.0	226.0
Sand, slightly silty; texture of sand grades from very fine to coarse.....	226.0	230.0
Sand and gravel, very fine sand to fine gravel.....	230.0	240.0
Sand, very fine to coarse.....	240.0	250.0
Sand and gravel, fine sand to medium gravel; slightly coarser from 270 to 280 ft.....	250.0	308.5
Clay, silty, light gray; grayish brown below 310 ft.....	308.5	313.5
Sand, very fine to fine with some medium; contains some fine gravel below 320 ft.....	313.5	325.0
Sand and gravel, fine sand to medium gravel.....	325.0	329.0
Silt, moderately clayey, light grayish brown.....	329.0	330.5
Sand and silt, interbedded; texture of sand grades from fine to very coarse.....	330.5	335.0
Sand and gravel, fine sand to medium gravel; contains silt from 337.5 to 338.5 ft.....	335.0	345.0
Cretaceous System - Upper Cretaceous Series - Colorado Group:		
Carlile Formation:		
Shale, clayey, medium gray to dark gray.....	345.0	360.0

Test Hole #55-A-50
(22N-3E-16ccdc)
Stanton County

Location: SW SE SW SW Sec. 16, T. 22 N., R. 3 E., approximately 672 feet east and 22 feet north of southwest corner.

Ground elevation: 1,675 ft. (a). (Stanton SE, 7.5 min quadrangle)

Depth to water: 49.2 ft. (10-17-50)

	<u>Depth, in feet</u>	
	From	To
Quaternary System, undifferentiated:		
Soil; silt, dark brown.....	0.0	1.0
Silt, slightly clayey, yellowish brown.....	1.0	2.5
Silt, medium yellowish brown, in part light gray; moderately calcareous below 10 ft.....	2.5	25.0
Silt, moderately calcareous, medium brown; light yellow to grayish brown below 30 ft; contains a few snail shells below 40 ft.....	25.0	50.0
Silt, light bluish gray.....	50.0	57.5
Clay, silty, light gray to medium gray.....	57.5	61.0
Sand and gravel, silty, slightly calcareous; texture grades from medium sand to medium gravel.....	61.0	62.5
Sand, silty and silt, slightly sandy to moderately clayey, interbedded; moderately calcareous.....	62.5	68.0
Silt, clayey to slightly sandy and gravelly, very calcareous, light bluish gray.....	68.0	72.5
Gravel, fine to coarse; contains dark colored grains and limy fragments.....	72.5	74.5
Clay, slightly sandy, moderately calcareous, light brown.....	74.5	79.5
Till; clay, silty to sandy and gravelly, moderately calcareous, light yellowish brown; in part light gray below 125 ft; medium gray below 130 ft.....	79.5	148.5
Till; clay, silty to sandy, moderately calcareous, medium yellowish brown; in part medium gray below 149 ft.....	148.5	154.0
Till; clay, silty to slightly sandy and gravelly, moderately calcareous, dark gray.....	154.0	166.0
Till; silt, clayey to sandy and gravelly, moder- ately calcareous, dark yellowish brown.....	166.0	172.5
Till; clay, silty to slightly sandy and gravelly, moderately calcareous, dark gray.....	172.5	178.0
Till; silt, slightly clayey to moderately sandy, slightly calcareous, dark yellowish brown; con- tains very fine to fine sand.....	178.0	187.0

Till; clay, silty to slightly sandy and gravelly, moderately calcareous, dark gray.....	187.0	214.5
Till; silt, clayey, in part moderately sandy and gravelly, moderately calcareous, dark brown.....	214.5	218.0
Till; clay, silty to slightly sandy and gravelly, moderately calcareous, dark gray; very calcareous below 230 ft.....	218.0	265.0
Sand and gravel, contains many limy fragments.....	265.0	266.5
Till; clay, silty to slightly sandy and gravelly, very calcareous, dark gray.....	266.5	328.5
Silt, very sandy, very calcareous, light gray; contains fine to medium sand.....	328.5	330.0
Sand, fine to coarse.....	330.0	334.0
Silt, slightly clayey to slightly sandy, very cal- careous, light gray; contains very fine to medium sand.....	334.0	350.0
Silt, in part sandy, very calcareous, light gray; contains very fine sand; moderately calcareous below 355 ft; finer texture below 385 ft.....	350.0	406.0
Sand, fine to very coarse; contains some fine gravel below 410 ft.....	406.0	420.0
Cretaceous System - Upper Cretaceous Series - Colorado Group:		
Carlile Formation:		
Shale, clayey, very calcareous, dark gray; contains limestone from 424 to 425 ft.....	420.0	430.0

Test Hole #53-A-50
(22N-3E-26dccd)
Stanton County

Location: SE SW SW SE Sec. 26, T. 22 N., R. 3 E., approximately 2000 feet west and 23 feet north of southeast corner.
 Ground elevation: 1,667.0 ft. (a). (Stanton SE, 7.5 min. quadrangle)
 Depth to water: 74.4 ft. (10-6-50).

	<u>Depth, in feet</u>	
	From	To
Quaternary System, undifferentiated:		
Soil; silt, moderately clayey, dark brownish gray...	0.0	2.0
Silt, moderately clayey, medium yellowish brown.....	2.0	10.0
Silt, slightly to moderately clayey, dark yellowish brown.....	10.0	11.5
Silt, moderately clayey, moderately calcareous, light yellowish brown.....	11.5	20.0
Silt, slightly to moderately clayey, moderately calcareous, light yellowish brown, in part light gray	20.0	30.0
Silt, slightly clayey, moderately calcareous, light yellowish brown to light grayish brown; slightly calcareous below 35 ft.....	30.0	40.0
Silt, moderately calcareous, light yellowish brown to light grayish brown.....	40.0	47.5
Silt, slightly clayey, soil-like, dark brown.....	47.5	48.0
Silt, slightly to moderately clayey, medium brown...	48.0	52.5
Clay, silty, light brown.....	52.5	54.0
Silt, clayey to slightly sandy, light brown; contains fine sand to fine gravel.....	54.0	55.0
Till; clay, silty to slightly sandy and gravelly, very calcareous, light yellowish gray; contains limy fragments; light gray below 66 ft.....	55.0	73.0
Till; silt, clayey to moderately sandy, very calcareous, light yellowish gray.....	73.0	78.0
Till; clay, slightly sandy, light gray to medium gray with some yellowish brown.....	78.0	80.0
Till; clay, silty to slightly sandy, moderately calcareous, light gray; very calcareous below 85 ft.....	80.0	100.0
Till; silt, very sandy, in part clayey, moderately calcareous, iron-stained.....	100.0	101.5
Till; clay, silty, moderately sandy to slightly gravelly, moderately calcareous, light gray to light yellowish gray; very sandy below 105; ft....	101.5	106.5
Sand and gravel, moderately calcareous; texture		

grades from medium sand to medium gravel.....	106.5	118.0
Till; silt, clayey to slightly sandy, moderately calcareous, medium brownish gray; medium gray below 120 ft; very calcareous below 130 ft.....	118.0	155.0
Sand and gravel, silty; contains many shale and limestone fragments.....	155.0	158.0
Till; silt, clayey to slightly sandy and gravelly, very calcareous, medium gray to dark gray.....	158.0	210.0
Till; silt, clayey to moderately sandy and gravelly, very calcareous, light brown.....	210.0	213.0
Sand, fine to very coarse.....	213.0	220.0
Silt, clayey to slightly sandy, light brown; moderately sandy below 235 ft.....	220.0	237.0
Sand, fine to coarse.....	237.0	240.0
Sand, silty, light brown; texture of sand grades from very fine to medium.....	240.0	241.5
Sand, fine to very coarse with some fine gravel.....	241.5	266.5
Silt, slightly clayey to sandy, light brown.....	266.5	272.0
Sand, fine to very coarse with a trace of fine gravel.....	272.0	280.0
Sand and gravel, fine sand to fine gravel.....	280.0	328.0
Silt, clayey, light bluish gray; light brown below 332 ft; light gray to brown below 340 ft.....	328.0	374.0
Sand and gravel, fine sand to medium gravel.....	374.0	378.0
Cretaceous System - Upper Cretaceous Series - Colorado Group:		
Carlile Formation:		
Shale, clayey, very calcareous, dark gray.....	378.0	390.0

Test Hole #56-A-50
(22N-3E-32aaba)
Stanton County

Location: NE NW NE NE Sec. 32, T. 22 N., R. 3 E., approximately 820 feet west and 25 feet south of northeast corner.
 Ground elevation: 1,663 ft. (a). (Stanton SE, 7.5 min. quadrangle)
 Depth to water: 39.1 ft. (10-17-8)

	<u>Depth, in feet</u>	
	From	To
Quaternary System, undifferentiated:		
Soil; silt, dark brownish gray.....	0.0	1.0
Silt, slightly clayey, dark brown.....	1.0	1.5
Silt, slightly clayey, slightly calcareous, medium yellowish brown; contains large limy nodules.....	1.5	4.0
Silt, slightly clayey, moderately calcareous, light gray and light yellowish gray.....	4.0	8.5
Silt, moderately calcareous, light yellowish brown; slightly clayey below 10 ft.....	8.5	30.0
Silt, light yellowish gray; slightly clayey below 40 ft.....	30.0	42.5
Silt, moderately clayey, medium brown.....	42.5	45.5
Till; clay, silty to moderately sandy, light yellowish gray; contains fine to medium sand.....	45.5	47.0
Till; clay, silty to sandy and gravelly, very calcareous, light gray; contains limy nodules.....	47.0	50.0
Till; silt, clayey to sandy and gravelly, moderately calcareous, light brownish gray.....	50.0	55.0
Clay, silty, moderately calcareous, light gray; contains a trace of very fine to medium sand; light brown below 57 ft.....	55.0	59.5
Till; clay, silty to slightly sandy and gravelly, moderately calcareous, light brown; in part gray below 90 ft; very calcareous from 110 to 122 ft; medium gray below 122 ft.....	59.5	138.0
Till; clay, silty to sandy and gravelly, moderately calcareous, yellowish gray; medium gray below 144 ft.....	138.0	150.0
Till; silt, moderately clayey to sandy and gravelly, very calcareous, medium gray.....	150.0	180.0
Sand, moderately calcareous; texture grades from fine to coarse.....	180.0	184.0
Till; silt, sandy, very calcareous, medium gray; texture of sand grades from very fine to medium...	184.0	187.0
Till; clay, silty to sandy and gravelly, very cal-		

careous, medium gray.....	187.0	190.5
Till; silt, sandy, very calcareous, medium gray; texture of sand grades from very fine to fine.....	190.5	193.0
Till; clay, silty to sandy and gravelly, very cal- careous, medium gray.....	193.0	212.0
Sand, moderately calcareous; texture grades from fine to medium.....	212.0	215.5
Till; clay, silty to slightly sandy and gravelly, very calcareous, medium gray.....	215.5	260.0
Till; clay, silty to sandy and gravelly, very cal- careous, medium gray.....	260.0	266.5
Silt, sandy, moderately calcareous, light gray; tex- ture of sand grades from very fine to fine.....	266.5	268.0
Sand, moderately calcareous; texture grades from very fine to fine with some medium; slightly coarser below 285 ft.....	268.0	290.0
Sand, fine to coarse; contains some fine gravel below 300 ft.....	290.0	310.0
Sand and gravel, fine sand to fine gravel with some medium gravel.....	310.0	334.5
Silt, slightly clayey to sandy, light grayish green; contains very fine sand.....	334.5	339.5
Sand, fine to coarse with some fine gravel.....	339.5	344.5
Sand and gravel, fine sand to fine gravel; interbedded with silt, clayey to sandy, light grayish green; contains very fine sand; contains less silt below 350 ft.....	344.5	360.5
Cretaceous System - Upper Cretaceous Series - Colorado Group:		
Carlile Formation:		
Shale, clayey, yellowish green to dark green.....	360.5	362.5
Shale, clayey, moderately to very calcareous, dark gray.....	362.5	370.0

**Test Hole #15-A-43
(23N-1E-6bbad)
Stanton County**

Location: SE NE NW NW Sec. 6, T. 23 N., R. 1 E., approximately 500 feet south and 1,100 feet east of the northwest corner.

Ground elevation: 1,500.0 ft. (i). (Hoskins, 7.5 min. quadrangle)

Depth to water: 5.4 ft. (8-6-43).

	<u>Depth, in feet</u>	
	From	To
Quaternary System, undifferentiated:		
Clay, silty, dark brownish gray; contains some sand.	0.0	10.0
Sand, light gray; texture grades from medium to coarse sand with a trace of gravel.....	10.0	27.0
Gravel, dark gray and pink; texture grades from fine to medium.....	27.0	59.0
Cretaceous System - Upper Cretaceous Series - Colorado Group:		
Niobrara Formation:		
Shale, chalky, medium gray speckled white.....	59.0	64.0

Test Hole #16-A-43
(23N-1E-6cbcc)
Stanton County

Location: SW SW NW SW Sec. 6, T. 23 N., R. 1 E., approximately 1,575 feet north of southwest corner.

Ground elevation: 1,500.0 ft. (i). (Madison NE, 7.5 min quadrangle)

Depth to water: 5.5 ft. (8-12-43).

	<u>Depth, in feet</u>	
	From	To
Quaternary System, undifferentiated:		
Road fill; clay, silty, in part sandy, dark gray to black.....	0.0	4.0
Sand, light gray; texture grades from medium to coarse with some gravel.....	4.0	30.0
Gravel, dark gray; texture grades from fine to medium.....	30.0	49.0
Cretaceous System - Upper Cretaceous Series - Colorado Group:		
Niobrara Formation:		
Shale, chalky, dark gray, speckled white.....	49.0	54.0

Test Hole #17-A-43
(23N-1E-7bbcc)
Stanton County

Location: SW SW NW NW Sec. 7, T. 23 N., R. 1 E., approximately 1,320 feet south of northwest corner.

Ground elevation: 1,496.0 ft. (i). (Madison NE, 7.5 min quadrangle)

Depth to water: 5.7 ft. (8-12-43).

	<u>Depth, in feet</u>	
	From	To
Quaternary System, undifferentiated:		
Sand, brownish gray; texture grades from medium to coarse.....	0.0	9.0
Sand, gray; texture grades from medium to coarse with a trace of gravel.....	9.0	29.0
Gravel, dark gray; texture grades from fine to medium.....	29.0	40.0
Gravel, dark gray; texture grades from medium to coarse; contains many chalk pebbles.....	40.0	44.0
Cretaceous System - Upper Cretaceous Series - Colorado Group:		
Niobrara Formation:		
Shale, medium gray, speckled white, chalky.....	44.0	49.0

Test Hole #18-A-43
(23N-1E-7cccc)
Stanton County

Location: SW SW SW SW Sec. 7, T. 23 N., R. 1 E., approximately 96 feet northeast of southwest corner.

Ground elevation: 1,498.0 ft. (i). (Madison NE, 7.5 min quadrangle)

Depth to water: 5.2 ft. (8-12-43).

	<u>Depth, in feet</u>	
	From	To
Quaternary System, undifferentiated:		
Sand, light brownish gray; texture grades from fine to medium.....	0.0	9.0
Sand, light gray; texture grades from medium to coarse.....	9.0	22.0
Gravel, dark gray and pink; texture grades from fine to medium with some sand.....	22.0	34.0
Gravel, dark gray; texture grades from fine to medium.....	34.0	54.0
Gravel, dark gray; contains pebbles of pink chalk...	54.0	60.0
Cretaceous System - Upper Cretaceous Series - Colorado Group:		
Niobrara Formation:		
Shale, chalky, dark gray, speckled white.....	60.0	69.0

Test Hole #60-A-43
(23N-1E-13abbb)
Stanton County

Location: NW NW NW NE Sec. 13, T. 23 N., R. 1 E., approximately
 2,580 feet west of northeast corner.

Ground elevation: 1,543.0 ft. (i). (Madison NE, 7.5 min. quadrangle)

Depth to water: 31.1 ft. (9-30-43)

Depth, in feet
 From To

Quaternary System, undifferentiated:

Clay, silty, medium gray to pinkish tan; dark in upper part; contains small gastropods and limy silt concretions in lower part.....	0.0	56.0
Gravel, pink, in part dark gray; texture grades from fine to medium with some coarse sand.....	56.0	69.0

Tertiary System - Miocene Series - Ogallala Group:

Siltstone, sandy, light gray.....	69.0	79.0
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**Test Hole #19-A-43
(23N-1E-18bccc)
Stanton County**

Location: SW SW SW NW Sec. 18, T. 23 N., R. 1 E., approximately
2,300 feet south and 5 feet east of the northwest corner.

Ground elevation: 1,506.0 ft. (i). (Madison NE, 7.5 min quadrangle)

Depth to water: 8.6 ft. (8-12-43)

	<u>Depth, in feet</u>	
	From	To
Quaternary System, undifferentiated:		
Sand, brownish gray; texture grades from fine to coarse.....	0.0	9.0
Sand, light brownish gray; texture grades from fine to coarse with some fine gravel.....	9.0	29.0
Gravel and sand, pinkish gray and dark gray; texture grades from medium sand to medium gravel.....	29.0	49.0
Tertiary System - Miocene Series - Ogallala Group:		
Siltstone, calcareous, light gray; in part marl.....	49.0	55.0
Sandstone, silty, and siltstone, sandy; light gray and pinkish gray; contains reworked chalk pebbles in lower part.....	55.0	72.0
Cretaceous System - Upper Cretaceous Series - Colorado Group:		
Niobrara Formation:		
Shale, chalky, medium gray, speckled white.....	72.0	74.0

Test Hole #24-A-43
(23N-1E-24abbb)
Stanton County

Location: NW NW NW NE Sec. 24, T. 23 N., R. 1 E., approximately
 2,640 feet west and 86 feet south of northeast corner.

Ground elevation: 1,507.0 ft. (i). (Madison NE, 7.5 min quadrangle)

Depth to water: Unknown; test hole caved at 26.0 ft. (8-14-43).

	<u>Depth, in feet</u>	
	From	To
Quaternary System, undifferentiated:		
Clay, silty, medium brownish gray.....	0.0	14.0
Clay, silty, medium gray to brownish gray.....	14.0	29.0
Clay, silty, medium greenish gray.....	29.0	39.0
Gravel, light gray and dark gray; texture grades from fine to medium.....	39.0	52.0
Gravel, pinkish gray; texture grades from fine to medium; contains coarse sand in lower part.....	52.0	79.0
Tertiary System - Miocene Series - Ogallala Group:		
Siltstone, calcareous, light gray to white; in part marl.....	79.0	88.0

**Test Hole #25-A-43
(23N-1E-24cddd)
Stanton County**

Location: SE SE SE SW Sec. 24, T. 23 N., R. 1 E., approximately
2,640 feet east of southwest corner.

Ground elevation: 1,483.0 ft. (i). (Madison NE, 7.5 min quadrangle)

Depth to water: 27.6 ft. (8-14-43).

	<u>Depth, in feet</u>	
	From	To
Quaternary System, undifferentiated:		
Clay, silty to very sandy, dark brownish gray.....	0.0	9.0
Clay, silty, medium gray to pinkish tan.....	9.0	30.0
Gravel, fine to medium gravel with some coarse sand.	30.0	64.0
Tertiary System - Miocene Series - Ogallala Group:		
Siltstone, calcareous, light gray; in part marl.....	64.0	84.0
Cretaceous System - Upper Cretaceous Series - Colorado Group:		
Niobrara Formation:		
Shale, chalky, medium gray, speckled white.....	84.0	88.0

**Test Hole #26-A-43
(23N-1E-25dbbb)
Stanton County**

Location: NW NW NW SE Sec. 25, T. 23 N., R. 1 E., approximately
2,640 feet north and 2,640 feet west of the southeast corner.
Ground elevation: 1,464.0 ft. (i). (Madison NE, 7.5 min quadrangle)
Depth to water: 8.0 ft. (8-14-43)

	<u>Depth, in feet</u>	
	From	To
Quaternary System, undifferentiated:		
Clay, silty to sandy, dark gray.....	0.0	15.0
Gravel, light gray, pink and dark gray; texture grades from fine to medium gravel with some coarse sand.....	15.0	64.0
Tertiary System - Miocene Series - Ogallala Group:		
Siltstone, calcareous, light gray to white; in part marl.....	64.0	76.0
Cretaceous System - Upper Cretaceous Series - Colorado Group:		
Niobrara Formation:		
Shale, chalky, white.....	76.0	79.0

Test Hole #27-A-43
(23N-1E-36bddd)
Stanton County

Location: SE SE SE NW Sec. 36, T. 23 N., R. 1 E., approximately
 2,500 feet east and 2,640 feet south of the northwest corner.

Ground elevation: 1,460.0 ft. (i). (Madison NE, 7.5 min quadrangle)

Depth to water: 5.3 ft. (8-14-43).

Depth, in feet

From To

Quaternary System, undifferentiated:

Sand, silty, to clay, sandy; brownish gray to dark gray.....	0.0	5.0
Sand, gray; texture grades from medium to coarse with some fine gravel.....	5.0	25.0
Gravel, dark gray, in part pink; texture grades from fine to medium.....	25.0	48.0

Test Hole #28-A-43
(23N-1E-36dccc)
Stanton County

Location: SW SW SW SE Sec. 36, T. 23 N., R. 1 E., approximately
 2,640 feet west of southeast corner.

Ground elevation: 1,467.0 ft. (i). (Madison NE, 7.5 min quadrangle)

Depth to water: 11.2 ft. (8-14-43).

	<u>Depth, in feet</u>	
	From	To
Quaternary System, undifferentiated:		
Silt, clayey, brownish gray, dark in upper part.....	0.0	9.0
Clay, silty, medium gray.....	9.0	16.0
Sand, light gray; texture grades from fine to coarse	16.0	32.0
Gravel, fine texture with some sand, dark gray and pink.....	32.0	74.0
Sand, coarse texture with some fine gravel, gray; contains some light greenish gray clay from 79 to 89 ft.....	74.0	94.0
Tertiary System - Miocene Series - Ogallala Group:		
Siltstone, calcareous, light gray.....	94.0	98.0

Test Hole #68-A-43
(23N-2E-11ddaa)
Stanton County

Location: NE NE SE SE Sec. 11, T. 23 N., R. 2 E., approximately
 1,300 feet north and 250 feet west of the southeast corner.

Ground elevation: 1,437.0 ft. (i). (Stanton, 7.5 min. quadrangle)

Depth to water: 11.2 ft. (9-30-43).

	<u>Depth, in feet</u>	
	From	To
Quaternary System, undifferentiated:		
Clay, silty, to silt, clayey; sandy and brown in upper part; medium gray and contains gastropods in lower part.....	0.0	21.0
Sand and some gravel, pinkish gray; texture grades from fine to coarse sand with some fine to medium gravel.....	21.0	44.0
Gravel, pinkish gray; texture grades from fine to medium gravel with some sand.....	44.0	52.0
Sand and gravel, pinkish gray; texture grades from fine sand to medium gravel.....	52.0	79.0
Cretaceous System - Upper Cretaceous Series - Colorado Group:		
Carlile Formation:		
Shale, dark gray to black.....	79.0	89.0

Test Hole #63-A-43
(23N-2E-14bbcc)
Stanton County

Location: SW SW NW NW Sec. 14, T. 23 N., R. 2 E., approximately
 1,100 feet south of the northwest corner.

Ground elevation: 1,442.0 ft. (i). (Stanton, 7.5 min. quadrangle)

Depth to water: 12.8 ft. (9-30-43).

	<u>Depth, in feet</u>	
	From	To
Quaternary System, undifferentiated:		
Clay, silty, brownish gray to pinkish tan.....	0.0	17.0
Sand, gray; texture grades from medium to coarse; contains some fine gravel below 28 ft.....	17.0	44.0
Gravel, pinkish gray; texture grades from fine to medium gravel with some sand.....	44.0	50.0
Tertiary System - Miocene Series - Ogallala Group:		
Siltstone, sandy, light gray.....	50.0	59.0

Test Hole #67-A-43
(23N-2E-14cccc)
Stanton County

Location: SW SW SW SW Sec. 14, T. 23 N., R. 2 E., approximately in
the southwest corner
Ground elevation: 1,437.0 ft. (i). (Stanton, 7.5 min. quadrangle)
Depth to water: 6.9 ft. (9-30-43).

	<u>Depth, in feet</u>	
	From	To
Quaternary System, undifferentiated:		
Clay, silty, dark gray.....	0.0	1.0
Sand, gray; texture grades from medium to coarse sand with some fine to medium gravel.....	1.0	26.0
Clay, silty, medium gray.....	26.0	29.0
Sand, gray and pink; texture grades from fine to coarse sand with some fine gravel.....	29.0	41.0
Gravel, pink and gray; texture grades from fine to medium gravel with some sand.....	41.0	54.0
Sand and gravel, pink and gray; texture grades from coarse sand to medium gravel.....	54.0	73.0
Tertiary System - Miocene Series - Ogallala Group:		
Clay, silty, to siltstone; light greenish gray, in part white; bentonitic in upper part.....	73.0	79.0

Test Hole #66-A-43
(23N-2E-23aaaa)
Stanton County

Location: NE NE NE NE Sec. 23, T. 23 N., R. 2 E., approximately 98 feet south of northeast corner.

Ground elevation: 1,433.0 ft. (i). (Stanton, 7.5 min. quadrangle)

Depth to water: 5.7 ft. (9-30-43).

	<u>Depth, in feet</u>	
	From	To
Quaternary System, undifferentiated:		
Sand, gray; texture grades from fine to coarse; contains some dark gray to black silty clay.....	0.0	18.0
Sand, gray; texture grades from fine to coarse with some fine to medium gravel.....	18.0	34.0
Gravel, dark gray in part pink; texture grades from fine to medium gravel with some sand.....	34.0	59.0
Tertiary System - Miocene Series - Ogallala Group:		
Siltstone, bentonitic, light gray to light greenish gray.....	59.0	69.0

**Test Hole #65-A-43
(23N-2E-25bbbb)
Stanton County**

Location: NW NW NW NW Sec. 25, T. 23 N., R. 2 E., approximately 123 feet south of northwest corner.

Ground elevation: 1,476.0 ft. (i). (Stanton, 7.5 min. quadrangle)

Depth to water: unknown; test hole caved at 37.0 ft. (9-30-43).

Depth, in feet
From To

Quaternary System, undifferentiated:

Sand, brownish gray to light gray; texture grades from fine to medium.....	0.0	29.0
Clay, silty, to silt, clayey; light gray; dark gray to black in upper part; contains some sand.....	29.0	39.0
Clay, silty, medium gray in part pink; contains some sand and fine gravel.....	39.0	49.0

Test Hole #72-A-43
(23N-3E-10cbbb)
Stanton County

Location: NW NW NW SW Sec. 10, T. 23 N., R. 3 E., approximately
 2,640 feet north and 90 feet east of southwest corner.

Ground elevation: 1,421.0 ft. (i). (Stanton NE, 7.5 min. quadrangle)

Depth to water: 18.1 ft. (10-8-43).

	<u>Depth, in feet</u>	
	From	To
Quaternary System, undifferentiated:		
Clay, silty, to silt, clayey; medium brownish gray; greenish gray in lower part, contains some sand...	0.0	16.0
Sand, light gray to brown; texture grades from fine to coarse with a trace of fine gravel.....	16.0	42.0
Gravel, gray and pink; texture grades from fine to medium gravel with some sand.....	42.0	55.0
Cretaceous System - Upper Cretaceous Series - Colorado Group:		
Carlile Formation:		
Shale, dark gray to black.....	55.0	64.0

Test Hole #73-A-43
(23N-3E-15cbcc)
Stanton County

Location: NW SW NW SW Sec. 15, T. 23 N., R. 3 E., approximately
 1,575 feet north of southwest corner.

Ground elevation: 1,488.0 ft. (i). (Stanton NE, 7.5 Min. Quadrangle)

Depth to water: Unknown; test hole caved at 54.0 ft. (10-8-43).

Depth, in feet
 From To

Quaternary System, undifferentiated:

Sand, dark brownish gray; texture grades from fine to medium.....	0.0	3.0
Clay, silty, to silt, clayey; brownish gray to pink- ish tan.....	3.0	11.0
Sand, gray; texture grades from medium to coarse....	11.0	15.0
Clay, silty, medium greenish gray to brownish gray, in part pinkish tan.....	15.0	34.0
Clay, silty, light greenish gray; contains some sand	34.0	47.0
Sand, gray; texture grades from fine to coarse sand with some fine to medium gravel.....	47.0	59.0
Clay, silty, to silt, clayey; light gray; contains a trace of gravel.....	59.0	79.0

Test Hole #74-A-43
(23N-3E-27bcbb)
Stanton County

Location: NW NW SW NW Sec. 27, T. 23 N., R. 3 E., approximately
 1,575 feet south of northwest corner.

Ground elevation: 1,598.0 ft. (i). (Stanton NE, 7.5 min. quadrangle)

Depth to water: 37.6 ft. (10-8-43).

	<u>Depth, in feet</u>	
	From	To
Quaternary System, undifferentiated:		
Clay, silty, to silt, clayey; brownish gray.....	0.0	18.0
Clay, silty, light gray to brownish gray.....	18.0	39.0
Clay, silty, medium greenish gray.....	39.0	59.0

Test Hole #3-B-64
(23N-3E-28dadd
Stanton County

Location: SE SE NE SE Sec. 28, T. 23N., R. 3E., approximately 1,575 feet north and 7.5 feet west of the southeast corner.
 Ground elevation: 1,617 ft. (t). (Stanton NE, 7.5 min quadrangle)
 Depth to water: 37.66 ft. (7-2-64)

	<u>Depth, in feet</u>	
	From	To
Quaternary System, undifferentiated:		
No sample.....	0.0	0.7
Road fill; silt, sandy, dark brownish gray.....	0.7	4.0
Silt, slightly clayey, brownish gray; below 4.5 ft, light brown.....	4.0	10.0
Silt, slightly clayey, olive yellow.....	10.0	15.0
Silt, slightly clayey, sandy, light olive brown; sand is very fine; below 24 ft, limonitic nodules.	15.0	25.0
Silt, slightly clayey, slightly calcareous, olive gray; contains limy nodules; below 35 ft, some sand grains.....	25.0	42.0
Silt, slightly clayey, moderately calcareous, light olive brown, some yellow stain and limy nodules...	42.0	46.0
Silt, slightly clayey, slightly calcareous, light brownish gray; some yellow stain; from 50 to 60 ft, trace of snail shells.....	46.0	64.5
Silt, slightly clayey, very dark brown; from 65.5 to 66.5 ft, very dark gray; below 66.5 ft, dark gray.....	64.5	67.5
Silt, very clayey, trace sand, light blue gray.....	67.5	68.5
Clay, silty, light blue gray; contains some coarse sand to fine gravel, some pebbles; below 72 ft; contains coarse to very coarse sand grains.....	68.5	74.0
Till; silt, moderately sandy, light blue green; sand is very fine to fine.....	74.0	75.0
Till; clay, sandy to gravelly, some pebbles, very calcareous; contains limy nodules; below 80 ft, some olive, olive gray, yellow brown with pale brown, some iron stain, some limy areas and limy grains.....	75.0	96.0
Till; silt, clayey, sandy, gravelly, pebbly, very calcareous, mottled light gray to yellow brown; below 98 ft, light brownish gray to light olive gray.....	96.0	107.0
Till; silt, clayey, sandy to gravelly, very		

calcareous, light brownish gray to light blue gray; below 113 ft, light gray, less sand, gravel and pebbles.....	107.0	126.0
Silt, moderately clayey, very calcareous, pale brown to light brown gray, some yellow stain.....	126.0	130.0
Silt, moderately clayey, slightly sandy, moderately calcareous, pale brown; sand is very fine to fine.....	130.0	131.0
Clay, silty, sandy, moderately calcareous, mottled pale brown to reddish brown.....	131.0	134.0
Silt, very sandy, gravelly, moderately calcareous, light reddish brown; contains very fine sand to fine gravel.....	134.0	136.0
Sand, gravelly; fine sand to fine gravel.....	136.0	180.0

Test Hole #4-B-64
(23N-3E-28ddda)
Stanton County

Location: NE SE SE SE Sec. 28, T. 23 N., R. 3 E., approximately 414 feet north and 2 feet west of the southeast corner.
 Ground elevation: 1,583 ft. (t). (Stanton NE, 7.5 min. quadrangle)
 Depth to water: perched 13.80 ft. (7-2-64)

	<u>Depth, in feet</u>	
	From	To
Quaternary System, undifferentiated:		
Road fill.....	0.0	4.0
Silt, slightly clayey, very sandy, brown; sand is very fine to fine, trace of medium; below 5 ft, very dark gray.....	4.0	6.0
Sand, very silty, black; sand is very fine to medium; below 10 ft, slightly silty.....	6.0	15.0
Silt, moderately clayey, slightly sandy, dark grayish brown; sand is very fine.....	15.0	19.0
Silt, moderately clayey, mottled yellowish brown and gray; from 20.3 to 20.7 ft, mottled yellow brown and greenish gray; below 20.3 ft, moderately calcareous.....	19.0	20.7
Silt, slightly clayey, moderately calcareous, greenish gray; many limy areas; from 24.5 to 26 ft, dark greenish gray; below 26 ft, greenish gray.....	20.7	35.0
Silt, moderately clayey, moderately calcareous, dark gray; contains carbonaceous wood fragments; below 47 ft, less carbonaceous material.....	35.0	54.0
Silt, moderately clayey, sandy, dark gray; sand is very fine.....	54.0	59.0
Clay, silty, slightly sandy, dark gray.....	59.0	60.0
Silt, very clayey, moderately sandy, gray; sand is fine to coarse.....	60.0	61.0
Silt, very sandy, moderately clayey, greenish gray; very fine sand to fine gravel.....	61.0	67.0
Sand, slightly silty; sand is fine to very coarse with some fine to medium gravel.....	67.0	73.0
Till; clayey, silty, sandy, gravelly, moderately calcareous, light brownish gray; contains iron stain; below 80 ft, mottled light greenish and yellowish brown.....	73.0	81.0
Till; clayey, silty, sandy, gravelly, very calcareous, light gray; below 82 ft, yellow brown		

some light gray and light olive gray with some yellow brown.....	81.0	83.0
Silt, very clayey, slightly sandy, yellow brown; sand is fine to coarse with rare fine gravel.....	83.0	84.0
Till; clayey, sandy, gravelly, moderately calcareous, yellow brown some light gray and light olive gray.....	84.0	99.0
Silt, very clayey, moderately calcareous, pale brown, some black stain; contains few fine sand grains; below 99.3 ft, slightly sandy, very fine to coarse.....	99.0	100.0
Silt, very clayey, slightly sandy, moderately calcareous, light yellow brown; sand is very fine to fine with some coarser grains; below 102 ft, limy areas and zones.....	100.0	102.4
Silt, moderately clayey, very sandy to gravelly, moderately calcareous, pale brown; contains fine sand with fine gravel.....	102.4	104.0
Sand and gravel, very silty, slightly clayey; fine sand to medium gravel.....	104.0	105.0
Sand and gravel, fine sand to medium gravel.....	105.0	150.0
Sand, fine to coarse with very coarse sand, some fine gravel.....	155.0	165.0
Gravel, sandy; medium sand to medium gravel.....	165.0	180.0
Sand and gravel, fine sand to fine gravel, some medium gravel.....	180.0	190.0
Sand, gravelly; fine sand to fine gravel.....	190.0	195.0
Sand and gravel, fine sand to fine gravel.....	195.0	201.0
Tertiary System - Miocene Series - Ogallala Group:		
Silt, very clayey, coarse textured, very light gray.	201.0	205.0
Silt, moderately clayey, sandy, light gray.....	205.0	211.0
Sand, slightly silty; sand is very fine to medium...	211.0	214.0
Silt, moderately clayey, slightly sandy, light gray; sand is principally very fine.....	214.0	216.5
Sand, slightly clayey, very silty; sand is very fine to coarse.....	216.5	217.2
Sand, very fine to coarse, some quartz with black speckling; below 220 ft, sand is silty and slightly clayey, some very coarse sand.....	217.2	223.5
Silt, moderately clayey, in part very sandy, very light olive gray; sand is fine to coarse.....	223.5	224.2
Sand, very fine to coarse; below 225 ft, much dark and green silicates, some quartz.....	224.2	230.0
Silt, clayey, with reworked shale fragments, pale olive to yellow.....	230.0	231.0

Cretaceous System - Upper Cretaceous Series - Colorado Group:

Carlile Formation:

Shale, clayey, silty, light olive gray to light gray, some iron stain; below 233 ft, some medium dark gray.....	231.0	234.0
Shale, clayey, dark gray with brownish yellow; some iron stain to 240 ft; below 246.5 ft, slightly calcareous; below 249.5 ft, some olive gray and yellow brown.....	234.0	250.0
Shale, clayey, moderately calcareous, dark gray.....	250.0	260.5

Test Hole #75-A-43
(23N-3E-34bccb)
Stanton County

Location: NW SW SW NW Sec. 34, T. 23 N., R. 3 E., approximately
 2,100 feet south of northwest corner.

Ground elevation: 1,572.0 ft. (i). (Stanton NE, 7.5 min. quadrangle)

Depth to water: 14.1 ft. (10-8-43).

	<u>Depth, in feet</u>	
	From	To
Quaternary System, undifferentiated:		
Sand, gray; texture grades from fine to coarse; contains some medium gray silty clay.....	0.0	10.0
Clay, silty, to silt, clayey; medium greenish gray to brownish gray.....	10.0	23.0
Clay, silty, medium gray; contains gastropod shells below 39 ft.....	23.0	49.0
Clay, silty to pebbly, medium greenish gray; probably till.....	49.0	59.0

**Test Hole #8-B-43
(24N-1E-17ccdd)
Stanton County**

Location: SE SE SW SW Sec. 17, T. 24 N., R. 1 E., approximately
1,320 feet east of southwest corner.

Ground elevation: 1,676.0 ft. (i). (Hoskins, 7.5 min quadrangle)

Depth to water: 11.6 ft. (9-8-43).

	<u>Depth, in feet</u>	
	From	To
Quaternary System, undifferentiated:		
Clay, silty, brownish gray and light gray.....	0.0	13.0
Clay, silty, medium greenish gray.....	13.0	45.0
Clay, silty, bentonitic, light gray.....	45.0	60.0

Test Hole #13-A-43
(24N-1E-31bdaa)
Stanton County

Location: NE NE SE NW Sec. 31, T. 24 N., R. 1 E., approximately
 2,640 feet east and 1,575 feet south of northwest corner.
 Ground elevation: 1,537.0 ft. (i). (Hoskins, 7.5 min quadrangle)
 Depth to water: 28.6 ft. (8-6-43).

Depth, in feet
 From To

Quaternary System, undifferentiated:

Sand, dark brownish gray; texture grades from fine to medium.....	0.0	4.0
Sand, brownish gray; texture grades from fine to coarse sand with some fine gravel.....	4.0	22.0
Gravel, pink and dark gray; texture grades from fine to medium; contains some reworked sandstone pebbles in lower part.....	22.0	39.0

Test Hole #14-A-43
(24N-1E-31dbcb)
Stanton County

Location: NW SW NW SE Sec. 31, T. 24 N., R. 1 E., approximately
 2,630 feet west and 1,800 feet north of the southeast corner.
 Ground elevation: 1,513.0 ft. (i). (Hoskins, 7.5 min quadrangle)
 Depth to water: 15.4 ft. (8-6-43).

	<u>Depth, in feet</u>	
	From	To
Quaternary System, undifferentiated:		
Soil; clay, silty, dark gray to black.....	0.0	2.0
Sand, light brownish gray; texture grades from fine to medium.....	2.0	13.0
Clay, silty, in part pebbly, light greenish gray to pinkish tan.....	13.0	19.0
Clay, silty and pebbly, dark gray to dark brownish gray.....	19.0	27.0
Sand, light gray and pink; texture grades from fine to coarse sand with some fine gravel.....	27.0	49.0
Gravel, dark gray and pink; texture grades from fine to medium.....	49.0	54.0
Cretaceous System - Upper Cretaceous Series - Colorado Group:		
Niobrara Formation:		
Shale, chalky, medium gray, speckled white.....	54.0	59.0

Test Hole #42-A-51
(24N-2E-3bbba)
Stanton County

Location: NE NW NW NW Sec. 3, T. 24 N., R. 2 E., approximately 356 feet east and 11 feet south of northwest corner.
 Ground elevation: 1,686 ft. (t). (Wayne SW, 7.5 min quadrangle)
 Depth to water: 48.1 ft. (10-26-51).

Depth, in feet
 From To

Quaternary System, undifferentiated:

Soil and road fill; silt, moderately clayey, moderately calcareous.....	0.0	1.0
Silt, moderately clayey, moderately calcareous, medium yellowish gray; contains a few limy pebbles...	1.0	1.5
Silt, slightly clayey, moderately calcareous, medium brownish yellow; mottled medium yellowish gray, light gray and light yellowish gray below 2.5 ft..	1.5	23.0
Silt, slightly to moderately clayey, moderately calcareous, medium yellowish gray; mottled brownish yellow from 28.5 to 31.0 ft; contains a trace of very fine to fine sand below 35 ft.....	23.0	37.0
Silt, slightly clayey, slightly calcareous, medium brownish gray.....	37.0	40.0
Silt, moderately clayey, soil-like, dark brownish gray.....	40.0	42.0
Silt, clayey, medium brownish gray.....	42.0	43.0
Clay, silty, medium brown; contains a trace of sand and pebbles.....	43.0	45.5
Till; clay, silty to slightly sandy and gravelly, very calcareous, light brownish gray; medium yellowish gray from 48 to 53 ft; contains some medium brown stain below 75.5 ft.....	45.5	96.7
Till; clay, very silty to slightly sandy and gravelly, moderately calcareous, light gray with some iron stain; medium gray below 103 ft.....	96.7	110.0
Till; clay, silty to sandy and pebbly, moderately calcareous, medium gray to dark gray; contains a trace of iron stain.....	110.0	192.7
Silt, moderately calcareous, medium gray; contains some dark brown peat.....	192.7	193.2
Till; clay, silty to sandy and pebbly, moderately calcareous, medium gray.....	193.2	224.5

Tertiary System - Miocene Series - Ogallala Group:

Silt, slightly clayey to very sandy, light greenish

gray; contains very fine to fine sand; more sandy from 226 to 228 ft; moderately clayey below 228 ft.....	224.5	228.5
Sand, slightly clayey to silty, light greenish gray; sand is very fine to fine.....	228.5	230.0
Sand, silty, light green and light brownish gray; texture of sand grades from very fine to fine; slightly coarser below 237 ft.....	230.0	240.0
Sand, slightly silty, medium brownish gray; texture of sand grades from very fine to fine with a trace of medium.....	240.0	250.0
Sand, in part slightly silty; texture of sand grades from very fine to fine.....	250.0	264.0
Silt, slightly clayey to sandy, light greenish gray; contains very fine sand.....	264.0	265.0
Silt, interbedded with sand, silty, light greenish gray; sand is very fine.....	265.0	270.0
Silt, slightly clayey, light gray.....	270.0	272.8
Silt, slightly clayey to very sandy, light gray; contains very fine sand.....	272.8	274.0
Silt, moderately clayey, light brownish gray; contains thin layers of sandy siltstone below 275 ft.....	274.0	280.0
Sand, brownish gray; texture grades from very fine to fine; contains some medium sand below 295 ft; texture grades from very fine to coarse below 300 ft.....	280.0	306.5
Clay to claystone; silty, green.....	306.5	307.0
Sand, slightly silty, light gray; texture of sand grades from very fine to fine with a trace of medium.....	307.0	320.0
Silt, in part clayey and in part sandy, green.....	320.0	321.0
Sand, in part silty; texture of sand grades from very fine to medium with a trace of coarse sand...	321.0	324.0
Clay, light green.....	324.0	324.8
Cretaceous System - Upper Cretaceous Series - Colorado Group:		
Niobrara Formation:		
Shale, chalky to clayey, light yellowish gray.....	324.8	326.0
Chalk, shaley, light yellow; light gray below 327 ft.....	326.0	329.0
Chalk, shaley, dark brownish gray; medium brownish gray below 331 ft; light gray below 334.5 ft; medium gray below 338 ft.....	329.0	340.0

Test Hole #43-A-51
(24N-2E-6bbb)
Stanton County

Location: NW NW NW NW Sec. 6, T. 24 N., R. 2 E., approximately 270 feet east and 22 feet south of northwest corner.
 Ground elevation: 1,820 ft. (t). (Hoskins, 7.5 min quadrangle)
 Depth to water: 48.6 ft. (11-14-51).

	<u>Depth, in feet</u>	
	From	To
Quaternary System, undifferentiated:		
Soil; silt, dark brownish gray; contains a trace of medium sand.....	0.0	0.5
Silt, slightly clayey, medium brownish gray.....	0.5	2.0
Silt, moderately clayey, moderately calcareous, medium yellowish gray; contains a few calcareous concretions.....	2.0	3.0
Silt, very clayey, very calcareous, medium yellowish gray; contains many calcareous concretions.....	3.0	5.0
Clay, very silty, moderately calcareous, medium yellowish gray, in part gray.....	5.0	8.5
Silt, slightly to moderately clayey, moderately calcareous, medium brownish gray; light gray and medium brownish yellow below 12 ft.....	8.5	30.0
Silt, moderately sandy, moderately calcareous, medium brown; contains very fine to fine sand; slightly sandy below 33.5 ft.....	30.0	35.0
Silt, moderately clayey, moderately calcareous, medium yellowish gray.....	35.0	38.5
Silt, very clayey, moderately calcareous, medium brownish gray.....	38.5	39.0
Silt, very clayey, soil-like, dark brownish gray....	39.0	40.0
Clay, very silty, dark brownish gray.....	40.0	42.0
Silt, very clayey, medium brown; contains a trace of sand.....	42.0	43.0
Clay, slightly silty, medium brownish gray; light brownish gray below 50 ft.....	43.0	52.5
Clay, slightly silty, slightly calcareous, light brownish gray; contains some limy nodules; contains a trace of sand (probably till).....	52.5	55.0
Till; clay, slightly silty to gravelly, moderately calcareous, medium brown; medium brownish gray below 65 ft.....	55.0	110.0
Till; clay, silty to very sandy, moderately calcareous, medium brownish yellow; contains very fine		

to medium sand with some gravel.....	110.0	110.5
Till; clay, silty to moderately sandy to pebbly, moderately calcareous, medium yellowish gray; slightly sandy to gravelly and medium brownish gray below 124 ft.....	110.5	130.5
Clay, slightly silty, medium brown.....	130.5	132.5
Till; clay, silty to gravelly, moderately calcar- eous, medium brownish gray.....	132.5	135.0
Till; clay, silty to slightly sandy and pebbly, slightly to moderately calcareous, medium brown...	135.0	138.5
Clay, silty, in part slightly calcareous, dark brownish gray.....	138.5	140.0
Till; clay, silty to slightly sandy and pebbly, moderately calcareous, medium brownish gray; medium yellowish gray and moderately sandy below 145.8 ft; medium gray below 195 ft.....	140.0	200.0
Till; clay, silty to moderately sandy and gravelly, moderately calcareous, medium brownish gray.....	200.0	201.0
Till; clay, silty to slightly sandy and pebbly, moderately calcareous, medium gray.....	201.0	344.0
Sand and gravel, slightly calcareous, principally green silicates and pink feldspar; texture grades from fine sand to fine gravel.....	344.0	349.5
Sand, silty, interbedded with silt, sandy; slightly calcareous.....	349.5	353.0
Sand, silty, light gray; texture grades from fine to medium.....	353.0	355.0
Sand, principally quartz, green silicates and some pink feldspar; texture grades from fine to coarse with some very coarse; contains silt, very sandy; texture of sand grades from very fine to fine from 356.4 to 357.0 ft and from 358.5 to 359.0 ft.....	355.0	359.6
Tertiary System - Miocene Series - Ogallala Group:		
Marl.....	359.6	374.0
Sand, slightly silty, principally green silicates; texture of sand grades from very fine to fine.....	374.0	410.0
Silt, very sandy, light gray to white; texture grades from coarse silt to fine sand.....	410.0	422.0
Sand, very fine to fine.....	422.0	443.0
Silt, clayey, slightly calcareous, light yellowish gray.....	443.0	445.0
Clay, sandy, to silt, sandy; in part moderately calcareous, light yellowish gray.....	445.0	447.4
Silt, sandy, to sand, silty; sand grades from very fine to fine with a trace of medium.....	447.4	450.0

Sand, silty, light grayish yellow; sand grades from very fine to fine.....	450.0	455.0
Siltstone, clayey, slightly calcareous, light gray- ish yellow.....	455.0	457.0
Clay, sandy, to silt, sandy; light gray.....	457.0	459.7
Silt, very sandy, to sand, very silty; contains very fine to medium sand, light yellowish gray.....	459.7	460.0
Clay, sandy, in part slightly calcareous, yellowish orange; contains very fine to coarse sand.....	460.0	462.0
Cretaceous System - Upper Cretaceous Series - Colorado Group:		
Niobrara Formation:		
Chalk, shaley, light gray to white; medium gray below 464 ft.....	462.0	470.0

Test Hole #21-A-51
(24N-3E-1aaaa)
Stanton County

Location: NE NE NE NE Sec. 1, T. 24 N., R. 3 E., approximately 51 feet west and 6 feet south of northeast corner.
 Ground elevation: 1,594 ft. (t). (Pilger, 7.5 min quadrangle)
 Depth to water: 42.6 ft. (8-15-51).

	<u>Depth, in feet</u>	
	From	To
Quaternary System, undifferentiated:		
Soil; silt, clayey, medium brown.....	0.0	1.0
Silt, clayey, medium yellowish brown.....	1.0	4.0
Silt, slightly clayey, light yellowish brown; moderately calcareous below 10 ft.....	4.0	40.5
Silt, slightly clayey, soil-like, medium grayish brown.....	40.5	41.5
Silt, moderately clayey, light grayish brown.....	41.5	42.5
Clay, moderately silty, light grayish brown; light brown below 45 ft.....	42.5	48.5
Clay, silty, light grayish brown.....	48.5	59.5
Silt, moderately clayey; contains a trace of sand...	59.5	66.0
Silt, very clayey, light brown; contains some fine to very coarse sand.....	66.0	70.0
Clay, silty, slightly calcareous, light grayish yellow; contains very fine to very coarse sand (probably till).....	70.0	70.5
Till; clay, moderately silty to sandy and gravelly, moderately calcareous, light grayish yellow; light gray below 100 ft; in part slightly calcareous below 105 ft.....	70.5	113.5
Till; clay, silty to sandy and pebbly, moderately calcareous, light yellowish gray; light brownish gray below 125 ft; medium gray below 149 ft.....	113.5	187.5
Clay, slightly silty, light gray.....	187.5	189.5
Till; clay, silty to sandy and gravelly, moderately calcareous, medium gray.....	189.5	208.0
Cretaceous System - Upper Cretaceous Series - Colorado Group:		
Carlile Formation:		
Shale, clayey, moderately calcareous, dark gray.....	208.0	210.0
Shale, clayey, slightly calcareous, dark gray.....	210.0	218.5
Shale, clayey, dark gray.....	218.5	230.0

Test Hole #20-A-51
(24N-3E-3bbcb)
Stanton County

Location: NW SW NW NW Sec. 3, T. 24 N., R. 3 E., approximately 712 feet south and 6 feet east of northwest corner.
 Ground elevation: 1,640 ft. (t). (Pilger, 7.5 min quadrangle)
 Depth to water: 36.1 ft. (8-15-51).

	<u>Depth, in feet</u>	
	From	To
Quaternary System, undifferentiated:		
Road fill.....	0.0	0.5
Soil; silt, moderately clayey, medium brownish gray; light yellowish gray below 3 ft.....	0.5	8.5
Silt, slightly clayey, slightly calcareous, light yellowish gray, in part gray.....	8.5	35.5
Silt, slightly clayey, soil-like, dark brown.....	35.5	37.5
Silt, very clayey, dark brownish gray; light brown below 40 ft.....	37.5	44.0
Clay, silty, to silt, clayey; light gray.....	44.0	55.0
Silt, in part clayey; contains many limy pebbles....	55.0	55.5
Silt, light brown.....	55.5	57.5
Silt, clayey, light brownish gray.....	57.5	59.0
Silt, clayey, to clay, silty; light bluish gray....	59.0	64.0
Silt, clayey to slightly sandy, light bluish gray; contains very fine to medium sand; slightly calcareous below 65.5 ft.....	64.0	66.5
Silt, moderately clayey to slightly sandy, dark grayish brown; contains very fine to medium sand; slightly calcareous and contains very fine to coarse sand below 67 ft.....	66.5	70.0
Clay, silty to moderately sandy and gravelly, light gray.....	70.0	72.0
Till; clay, silty to slightly sandy and pebbly, moderately calcareous, light yellowish gray; medium gray below 145 ft.....	72.0	183.0
Silt, sandy, moderately calcareous, light yellowish gray; contains very fine to coarse sand.....	183.0	185.0
Till; clay, silty to sandy and pebbly, moderately calcareous, medium gray.....	185.0	291.0
Cretaceous System - Upper Cretaceous Series - Colorado Group:		
Carlile Formation:		
Shale, clayey, dark gray.....	291.0	310.0

Test Hole #19-A-51
(24N-3E-21aaba)
Stanton County

Location: NE NW NE NE Sec. 21, T. 24 N., R. 3 E., approximately 902 feet west and 5 feet south of northeast corner.
 Ground elevation: 1,554 ft. (t). (Pilger, 7.5 min quadrangle)
 Depth to water: 50.3 ft. (8-7-51).

	<u>Depth, in feet</u>	
	From	To
Quaternary System, undifferentiated:		
Road fill.....	0.0	1.0
Clay, silty, medium brown.....	1.0	1.5
Silt, moderately clayey, medium yellowish brown; less clayey and moderately calcareous below 3 ft..	1.5	10.0
Silt, slightly clayey, moderately calcareous, yellowish brown.....	10.0	18.0
Silt, clayey, moderately calcareous, light brown....	18.0	30.0
Silt, slightly clayey, light brown; moderately calcareous from 30 to 35 ft.....	30.0	38.5
Silt, slightly clayey to slightly sandy, medium brown.....	38.5	40.0
Silt, slightly clayey, medium reddish brown; con- tains a trace of very fine to medium sand.....	40.0	42.5
Clay, slightly silty to sandy and pebbly, light yellowish gray (probably till).....	42.5	44.5
Till; clay, slightly silty to sandy and pebbly, slightly calcareous, light yellowish gray; con- tains limy nodules; very calcareous below 45 ft...	44.5	47.5
Till; clay, silty to moderately sandy and pebbly, moderately calcareous, yellowish brown; medium gray below 141 ft.....	47.5	201.5
Sand and gravel, green quartz and pink feldspar, moderately calcareous; texture grades from fine sand to medium gravel; contains shale, chalky from 204.3 to 204.5 ft.....	201.5	206.8
Boulder; shale, chalky, very calcareous.....	206.8	207.6
Sand and gravel, green quartz and pink feldspar, texture grades from medium sand to medium gravel..	207.6	211.0
Cretaceous System - Upper Cretaceous Series - Colorado Group:		
Carlile Formation:		
Shale, clayey, dark gray; slightly to moderately calcareous below 228 ft.....	211.0	230.0

**Test Hole #71-A-43
(24N-3E-27bbbb)
Stanton County**

Location: NW NW NW NW Sec. 27, T. 24 N., R. 3 E., approximately 10 feet south and 50 feet east of the northwest corner.
Ground elevation: 1,467.0 ft. (i). (Pilger, 7.5 min. quadrangle)
Depth to water: 41.5 ft. (10-5-43).

	<u>Depth, in feet</u>	
	From	To
Quaternary System, undifferentiated:		
Clay, silty, brownish gray.....	0.0	14.0
Clay, silty, to silt, clayey; medium greenish gray, in part pinkish tan.....	14.0	52.0
Sand and gravel, pinkish gray and dark gray, iron- stained; texture grades from coarse sand to fine gravel.....	52.0	66.0
Silt, clayey, light greenish gray to light gray.....	66.0	74.0
Gravel and sand, pink and gray; texture grades from fine sand to fine gravel.....	74.0	81.0
Cretaceous Series - Upper Cretaceous Series - Colorado Group:		
Carlile Formation:		
Shale or clay, dark gray to black.....	81.0	89.0

Test Hole #70-A-43
(24N-3E-28ddddd)
Stanton County

Location: SE SE SE SE Sec. 28, T. 24 N., R. 3 E., approximately 81 feet north and 74 feet west of the southeast corner.
 Ground elevation: 1,434.0 ft. (i). (Pilger, 7.5 min. quadrangle)
 Depth to water: 20.1 ft. (10-5-43).

	<u>Depth, in feet</u>	
	From	To
Quaternary System, undifferentiated:		
Clay, silty, brownish gray to pinkish tan.....	0.0	15.0
Sand, light brownish gray; texture grades from fine to coarse.....	15.0	29.0
Gravel, fine to medium with some sand.....	29.0	49.0
Cretaceous System - Upper Cretaceous Series - Colorado Group:		
Carlile Formation:		
Shale, dark gray to black.....	49.0	59.0

**Test Hole #69-A-43
(24N-3E-33dddd)
Stanton County**

Location: SE SE SE SE Sec. 33, T. 24 N., R. 3 E., approximately 10 feet north and 100 feet west of the southeast corner.
Ground elevation: 1,410.0 ft. (i). (Pilger, 7.5 min. quadrangle)
Depth to water: 9.3 ft. (10-5-43).

	<u>Depth, in feet</u>	
	From	To
Quaternary System, undifferentiated:		
Clay, silty, medium gray.....	0.0	11.0
Sand, gray; texture grades from fine to coarse sand with some fine to medium gravel.....	11.0	34.0
Gravel, dark gray; texture grades from fine to medium with some sand.....	34.0	42.0
Cretaceous System - Upper Cretaceous Series - Colorado Group:		
Carlile Formation:		
Shale, dark gray to black; contains some light brownish gray, very fine-grained sandstone in lower part.....	42.0	54.0